NEAs et alertes astrométriques

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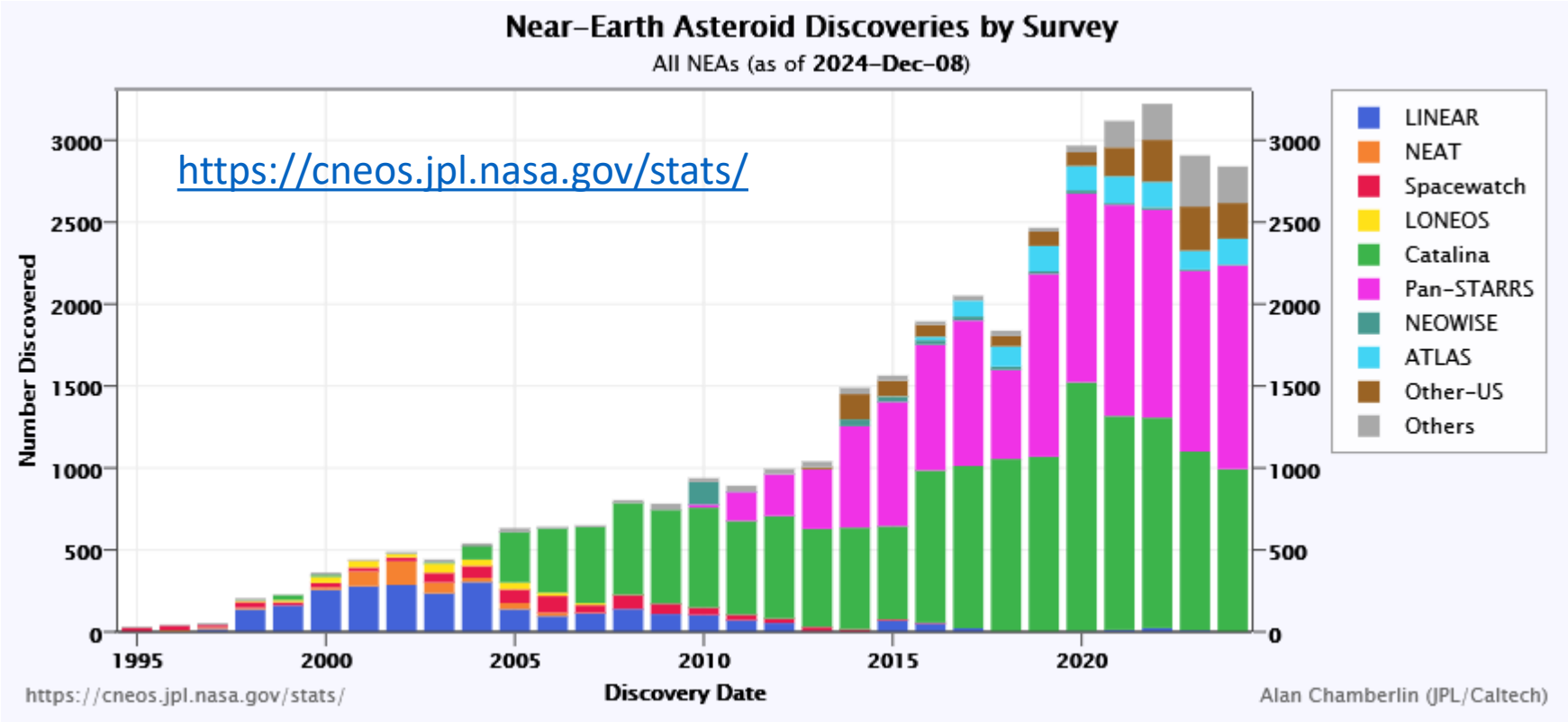
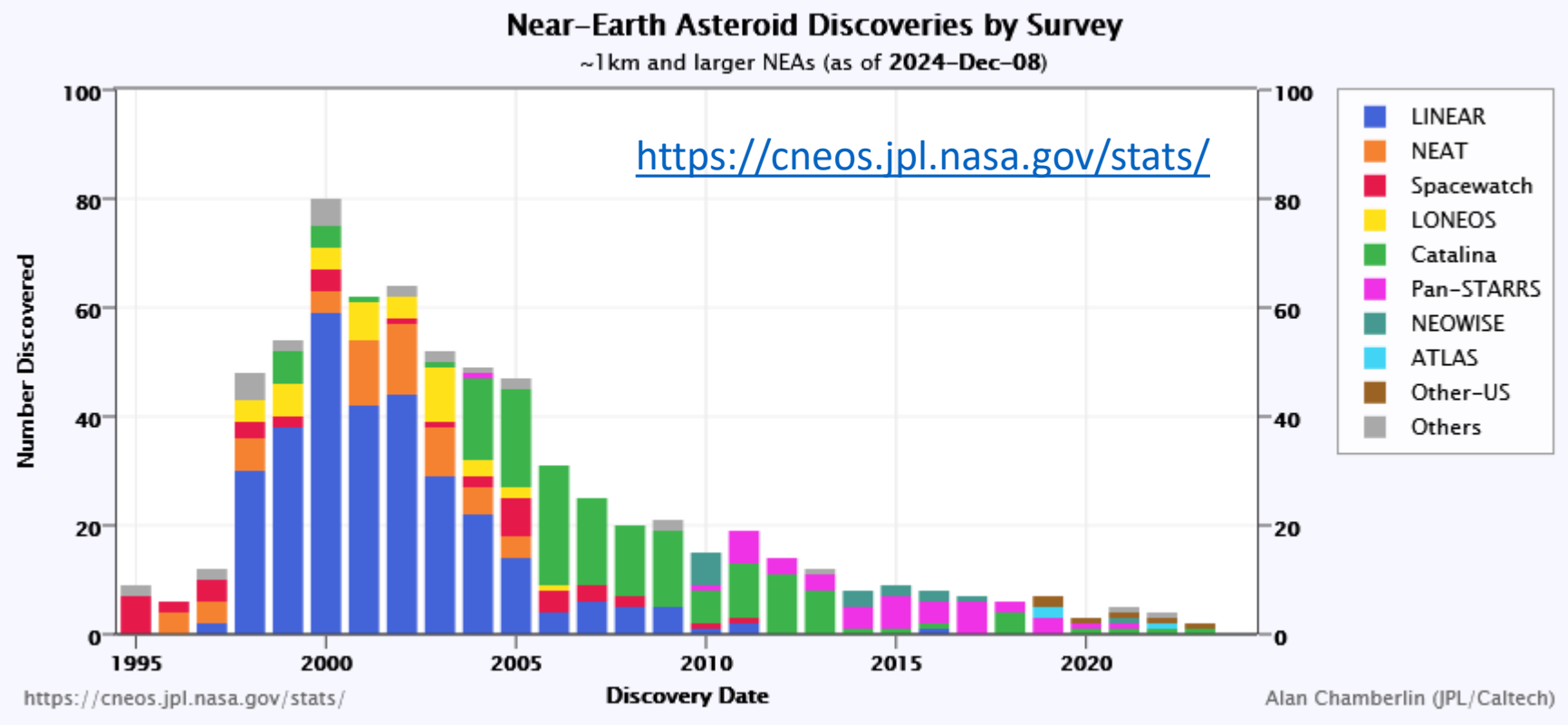
- Besoins d'astrométrie : télescopes de « petit » diamètre inclus
- Campagne des alertes astrométriques Gaia-FUN-SSO : 2016-2023
- Surveys (LSST) et autres missions spatiales ? (SVOM,…)
- Astrométrie des contreparties optiques alertes GRB, multimessager,…
- Objets géocroiseurs NEAs: forte demande
- Valider, identifier, déterminer l'orbite, permettre d'autres études ultérieures (caractérisation physique)

Au 12/12/2024:

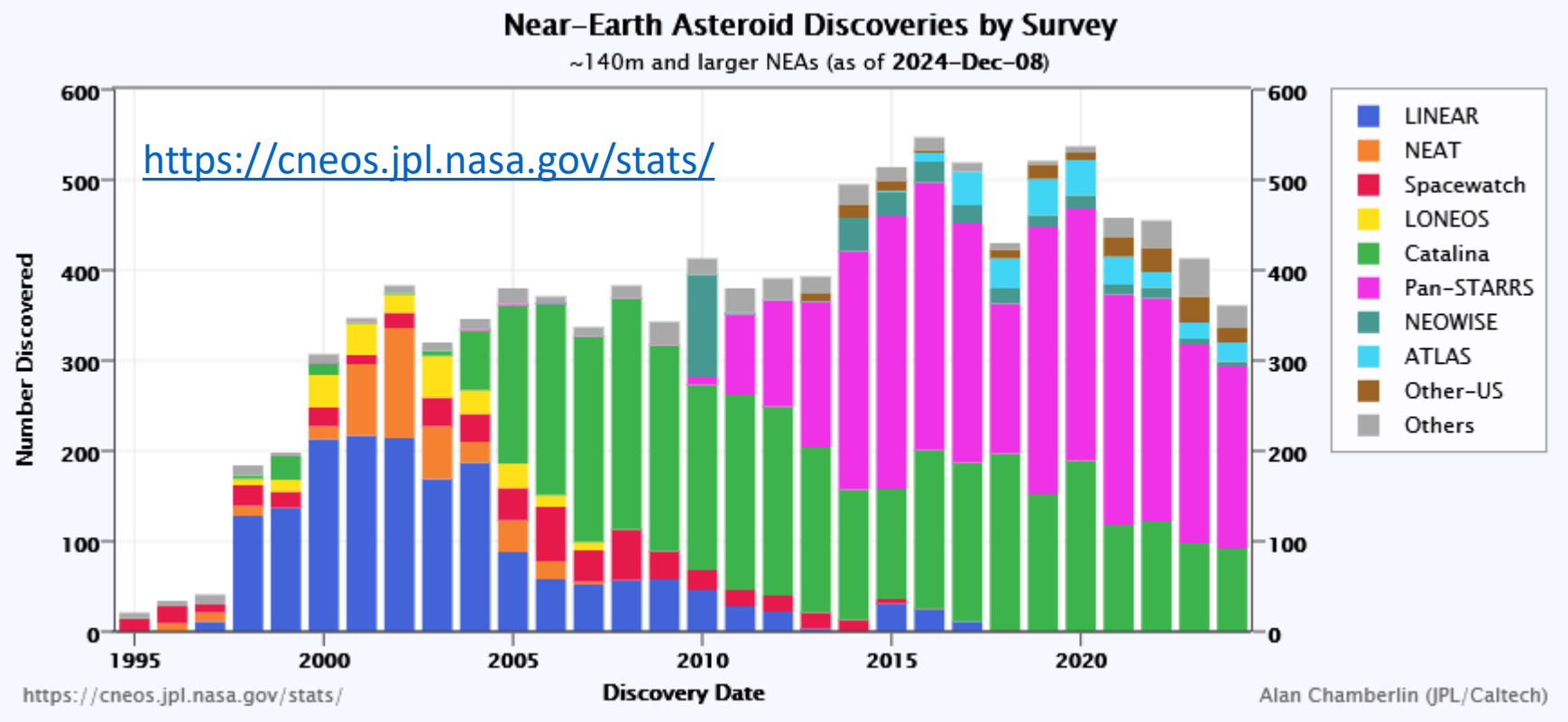
- NEOs : 36 932 asteroides (et 123 comètes)
- Rythme des découvertes: **~3000 par an**



95% des NEAs de diamètre > 1km sont connus
Rytme des détections: **quelques unités /an**



Potentially Hazardous Asteroids : 2468
Diamètre > 140m et rapprochement Terre < ~20 dist. Lunaire
Rythme des découvertes: **~400 par an**



Risque d'impact: Contexte international

IAWN International Asteroid Warning Network (2013, Nations Unis COPUOS)

- Découverte, suivi, caractérisation physique et dynamique
- Coordination de la réponse internationale en cas de menace d'impact

https://iawn.net/about.shtml

SMPAG Space Mission Planning Advisory Group (2013, Nations Unis COPUOS)

- Agences spatiales et autres
- réponse à une menace d'impact
- Coordination et mission spatiale d'évitement

https://www.cosmos.esa.int/web/smpag/

PDC Planetary Defense Conference (IAA, International Academy of Astronautics)

- Meeting scientifique international tous les 2 ans
- Communications scientifiques
- Scénarios de prédiction : impact potentiel puis confirmation

https://cneos.jpl.nasa.gov/pd/cs/pdc25/
https://iaaspace.org/event/9th-iaa-planetary-defense-conference-2025/

Impacteurs Imminents

Depuis 2008 (2008 TC3) :
11 détections d'impacteurs imminents
prédictions avant impact (date/heure et zonegéographique)

Pre-Impact Detections Table

Designation	Discovery time (UTC)	Impact time (UTC)	Warning time (hh:mm)	Size range (m)	Latitude (deg.)	Longitude (deg.)	Altitude (km)	Orbit viewer	Discovery station	Discovery MPEC	Reference
2008 TC3	2008-10-06 06:39	2008-10-07 02:45	20:05	3.8 - 4.4 m	20.9 N	31.8 E	50.0	View	Mt. Lemmon Survey	2008-T50	Jenniskens et al. (2009)
2014 AA	2014-01-01 06:18	2014-01-02 03:04	20:46	2 - 4 m	13.1 N	44.2 W	40.0	View	Mt. Lemmon Survey	2014-A02	Farnocchia et al. (2016)
2018 LA	2018-06-02 08:14	2018-06-02 16:44	08:29	2 - 5 m	21.3 S	23.3 E	27.8	View	Mt. Lemmon Survey	2018-L04	Jenniskens et al. (2021)
2019 MO	2019-06-22 09:49	2019-06-22 21:25	11:36	4 - 9 m	14.9 N	66.2 W	25.0	View	ATLAS-MLO	2019-M72	USG Fireball report
2022 EB5	2022-03-11 19:24	2022-03-11 21:22	01:58	1.4 - 3.2 m	70.0 N	9.1 W	33.3	View	GINOP-KHK	2022-E178	USG Fireball report
2022 WJ1	2022-11-19 04:53	2022-11-19 08:26	03:33	0.4 - 0.6 m	43.0 N	81.7 W	95.5	View	Mt. Lemmon Survey	2022-W69	Kareta et al. (2024)
2023 CX1	2023-02-12 20:18	2023-02-13 02:59	06:41	0.8 - 1.7 m	49.8 N	0.4 E	50.0	View	GINOP-KHK	2023-C103	JPL solution 4
2024 BX1	2024-01-20 21:48	2024-01-21 00:32	02:44	< 0.5 m	52.6 N	12.6 E	21.3	View	GINOP-KHK	2024-B76	Spurný et al. (2024)
2024 RW1	2024-09-04 05:43	2024-09-04 16:39	10:55	1 - 2.5 m	18.0 N	122.9 E	25.0	View	Mt. Lemmon Survey	2024-R68	USG Fireball report
2024 UQ	2024-10-22 09:08	2024-10-22 10:54	01:46	0.8 - 1.6 m	30.0 N	136.0 W	38.2	View	ATLAS-HKO, Haleakala	2024-U49	USG Fireball report
2024 XA1	2024-12-03 05:55	2024-12-03 16:14	10:19	0.7 - 1.5 m	60.9 N	119.5 E	50.0	View	Kitt Peak-Bok	2024-X68	JPL solution 4

https://cneos.jpl.nasa.gov/pi/

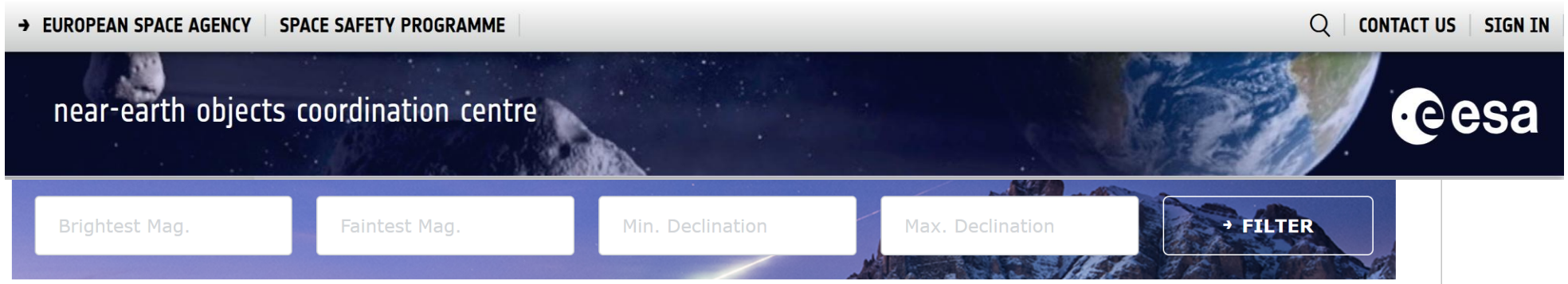
ESA Near-Earth Objects Coordination Center

https://neo.ssa.esa.int/

Priority list

UR Urgent
LP Low pri.
US Useful
NE Necessary

Améliorer notre connaissance de l'orbite



Priority List

Priority	Object designation	Inserted	R.A. in hh:mm	Declination in deg	Elongation in deg	Visual magnitude in mag	Sky uncert. in arcsec	End of visibility
LP	2024PN3	2024-12-09	07h02m	6.5	148	16.6	0	2025-04-06
LP	2024WB	2024-12-09	05h12m	18.5	175	17.3	0	2025-01-29
UR	2024WS17	2024-12-09	05h27m	22.1	175	17.6	3	2024-12-16
LP	2024PC34	2024-12-09	03h43m	-1.9	148	18.0	0	2025-02-10
LP	2024TS8	2024-12-09	06h20m	23.3	163	18.2	0	2025-02-14
US	2024WL15	2024-12-09	07h02m	44.6	148	18.8	0	2025-01-15
LP	2024TD24	2024-12-09	03h12m	32.4	153	19.0	0	2025-05-08
LP	2024PE6	2024-12-09	03h06m	55.0	141	19.2	0	2025-02-10
UR	2024XS	2024-12-09	03h27m	14.1	155	19.4	7	2024-12-13
UR	2024XP2	2024-12-09	02h32m	66.8	130	19.4	2	2024-12-13
UR	2024XF4	2024-12-09	07h38m	37.7	145	19.4	5	2024-12-23
NE	2024VE7	2024-12-09	00h27m	36.3	119	19.5	1	2025-01-04
UR	2024XF9	2024-12-09	03h22m	6.1	149	19.7	3	2024-12-14

Minor Planet Center MPC Confirmation page

The NEO Confirmation Page

Please ensure you are familiar with the notes at the bottom of this page.
Also, additional notes on the NEOCP and information on how we remove objects on the NEOCP are also available here.

Problems? Comments?

Get ephemerides | Reset form

Select object(s) from the current list of objects needing confirmation (NEO desirability score, discovery date, rough current position and magnitude given, as well as number of observation observed). Objects flagged with an "S" in the Note column are possibly in geocentric orbit and might soon be removed. Objects flagged with an "B" in the Note column have a possible bad not be correct. "B" flag does not overwrite the "S" flag.

All objects with *V* = -30 to 30, with Decl. between -90 ° and +90 °, with an NEO desirability score of 0 % to 100 %

or just the objects selected below: Deselect All | Select All

Temp Desig	Score	Discovery	R.A.	Decl.	V	Updated	Note	NObs	Arc	H	Not Seen/dys
MOU0001	54	2024 12 10.8	03 47.8	+69 23	16.9	Added Dec. 10.84 UT		6	0.01	9.7	0.802
A11fFZo	76	2024 12 10.5	04 55.0	+12 18	18.4	Updated Dec. 11.56 UT		26	1.09	28.2	0.053
CCGRUC2	98	2024 12 11.2	04 54.9	+28 50	18.8	Updated Dec. 11.58 UT		15	0.36	30.5	0.037
CCGZMM2	100	2024 12 11.5	11 45.2	+29 41	19.4	Updated Dec. 11.55 UT		11	0.04	22.4	0.056
C440QD1	98	2024 12 11.4	09 43.7	+49 01	19.4	Updated Dec. 11.53 UT		15	0.15	26.8	0.078
CCGV7V2	100	2024 12 11.2	05 39.4	+35 01	20.1	Updated Dec. 11.43 UT		11	0.19	22.4	0.173
CCGK792	91	2024 12 09.1	03 40.7	+48 22	20.1	Updated Dec. 11.35 UT		18	1.72	25.4	0.737
CCGWC32	100	2024 12 11.3	07 06.4	+35 02	20.3	Updated Dec. 11.50 UT		16	0.20	23.9	0.117
MHD0712	100	2024 12 08.0	03 48.2	+69 02	20.3	Updated Dec. 10.69 UT		27	1.27	17.4	2.330
P123szs	100	2024 12 08.4	05 03.8	-30 59	20.4	Updated Dec. 10.67 UT		10	0.91	18.7	2.288

- http://www.minorplanetcenter.net/iau/NEO/toconfirm_tabular.html
- Dernières détections découvertes (Added) ou mises à jour (Updated)
- Constamment mis à jour
- NEAs potentiels à confirmer et à mesurer (4 ou 5 points de mesures suffisants)
- Base de UTC valide à mieux que 1s

Minor Planet Center MPC Confirmation page

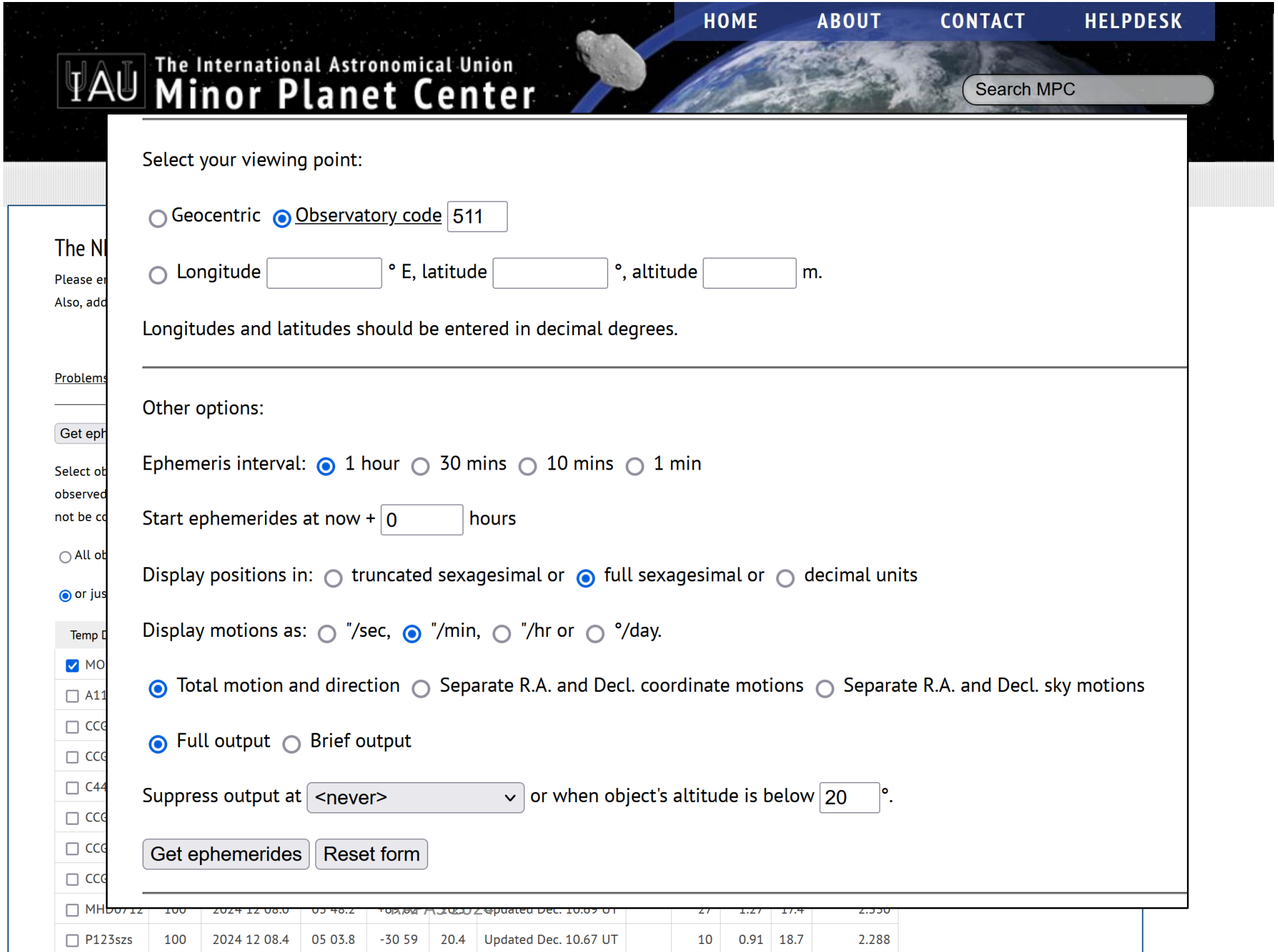
http://www.minorplanetcenter.net/iau/NEO/toconfirm_tabular.html

Dernières détections découvertes (Added) ou mises à jour (Updated)

Constamment mis à jour

NEAs potentiels à confirmer et à mesurer (4 ou 5 points de mesures suffisants)

Base de UTC valide à mieux que 1s



Minor Planet Center MPC Confirmation page

Ephéméride :
Après sélection d'objets: éphémérides RA DEC (t) mag. visibilité et Vitesse

MOU0001

Get the observations or orbits.

Date	UT	R.A. (J2000)	Decl.	Elong.	V	Motion		Object		Sun	Moon			Uncertainty
	h m					"/min	P.A.	Azi.	Alt.	Alt.	Phase	Dist.	Alt.	
2024 12 11	1300	03 47 56.9	+69 23 40	131.8	16.9	0.59	274.3	196	+28	+20	0.81	060	-01	Map/Offsets
2024 12 11	1310	03 47 55.8	+69 23 40	131.8	16.9	0.59	274.3	197	+28	+19	0.81	060	+01	Map/Offsets
2024 12 11	1320	03 47 54.7	+69 23 41	131.8	16.9	0.59	274.3	198	+29	+19	0.81	060	+03	Map/Offsets
2024 12 11	1330	03 47 53.6	+69 23 41	131.8	16.9	0.59	274.3	199	+29	+18	0.81	060	+04	Map/Offsets
2024 12 11	1340	03 47 52.5	+69 23 42	131.8	16.9	0.59	274.3	199	+30	+17	0.81	060	+06	Map/Offsets
2024 12 11	1350	03 47 51.4	+69 23 42	131.8	16.9	0.59	274.3	200	+31	+16	0.82	060	+08	Map/Offsets
2024 12 11	1400	03 47 50.3	+69 23 42	131.8	16.9	0.59	274.3	201	+31	+15	0.82	060	+09	Map/Offsets
2024 12 11	1410	03 47 49.2	+69 23 43	131.8	16.9	0.59	274.3	201	+32	+14	0.82	060	+11	Map/Offsets
2024 12 11	1420	03 47 48.1	+69 23 43	131.8	16.9	0.59	274.3	202	+33	+13	0.82	060	+13	Map/Offsets
2024 12 11	1430	03 47 47.0	+69 23 44	131.8	16.9	0.59	274.3	203	+33	+11	0.82	060	+15	Map/Offsets
2024 12 11	1440	03 47 45.8	+69 23 44	131.8	16.9	0.59	274.3	203	+34	+10	0.82	060	+17	Map/Offsets
2024 12 11	1450	03 47 44.7	+69 23 45	131.8	16.9	0.59	274.3	204	+35	+09	0.82	059	+18	Map/Offsets
2024 12 11	1500	03 47 43.6	+69 23 45	131.8	16.9	0.59	274.3	205	+35	+08	0.82	059	+20	Map/Offsets
2024 12 11	1510	03 47 42.5	+69 23 45	131.8	16.9	0.59	274.3	205	+36	+06	0.82	059	+22	Map/Offsets

Selon la vitesse:

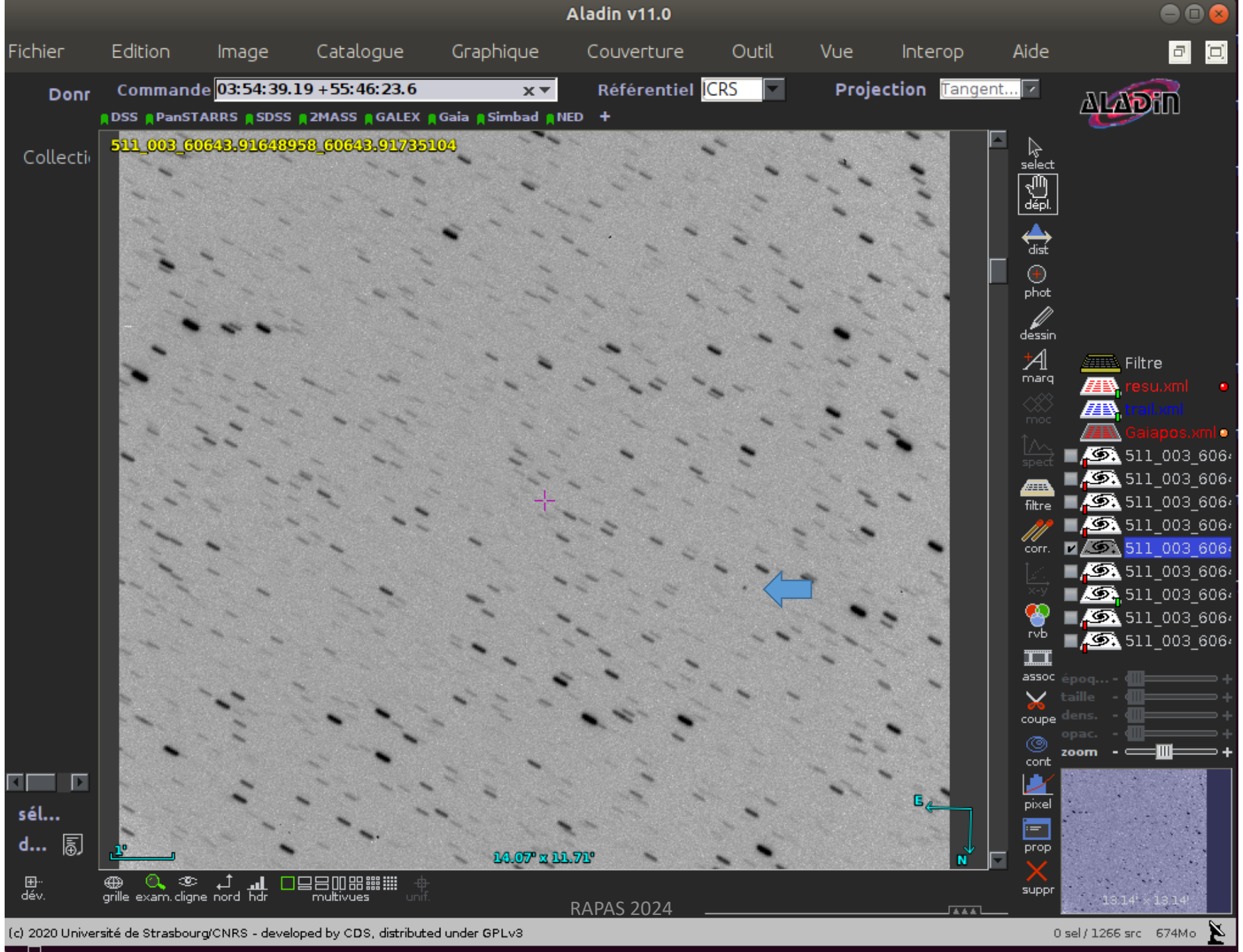
(1) suivi vitesse sidérale

A11fFZo

Get the observations or orbits.

Date	UT	*	R.A. (J2000)	Decl.	Elong.	V	Motion		Object		Sun	Moon			Uncertainty	
	h m						"/min	P.A.	Azi.	Alt.	Alt.	Phase	Dist.	Alt.		
... <suppressed> ...																
2024 12 11	1820		04 55 27.9	+11 40 47	167.6	18.6	6.01	202.7	274	+21	-25	0.83	045	+53	Map/Offsets	!!
2024 12 11	1830		04 55 26.3	+11 39 52	167.6	18.6	6.05	203.8	276	+23	-26	0.83	045	+54	Map/Offsets	!!
2024 12 11	1840		04 55 24.6	+11 38 56	167.6	18.6	6.09	204.9	277	+24	-28	0.83	044	+55	Map/Offsets	!!
2024 12 11	1850		04 55 22.8	+11 38 01	167.6	18.6	6.13	205.9	279	+26	-30	0.83	044	+56	Map/Offsets	!!
2024 12 11	1900		04 55 21.0	+11 37 06	167.6	18.6	6.17	206.9	281	+28	-32	0.83	044	+57	Map/Offsets	!!
2024 12 11	1910		04 55 19.0	+11 36 11	167.5	18.6	6.22	207.9	283	+30	-34	0.84	044	+58	Map/Offsets	!!
2024 12 11	1920		04 55 17.0	+11 35 16	167.5	18.6	6.26	208.8	285	+32	-35	0.84	044	+59	Map/Offsets	!!
2024 12 11	1930		04 55 14.9	+11 34 21	167.5	18.6	6.31	209.7	287	+33	-37	0.84	044	+59	Map/Offsets	!!
2024 12 11	1940		04 55 12.8	+11 33 27	167.5	18.6	6.35	210.5	289	+35	-39	0.84	044	+60	Map/Offsets	!!
2024 12 11	1950		04 55 10.5	+11 32 32	167.4	18.6	6.39	211.2	292	+37	-41	0.84	044	+60	Map/Offsets	!!
2024 12 11	2000		04 55 08.2	+11 31 37	167.4	18.6	6.44	211.9	294	+38	-43	0.84	044	+61	Map/Offsets	!!
2024 12 11	2010		04 55 05.9	+11 30 43	167.4	18.6	6.48	212.6	296	+40	-44	0.84	044	+61	Map/Offsets	!!
2024 12 11	2020		04 55 03.5	+11 29 48	167.4	18.6	6.52	213.2	299	+42	-46	0.84	043	+61	Map/Offsets	!!
2024 12 11	2030		04 55 01.0	+11 28 53	167.4	18.6	6.56	213.8	301	+43	-48	0.84	043	+60	Map/Offsets	!!

(2) « Tracking »: réglage pour suivi sur l'astéroïde
pour OHP T120: pixel 0.68 arcsec
si vitesse au dessus de 1 arcsec/min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Projection
Tangent...
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PanSTARRS
SDSS
2MASS
GALEX
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Gaiapos.xml
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(c) 2020 Université de Strasbourg/CNRS - developed by CDS, distributed under GPLv3
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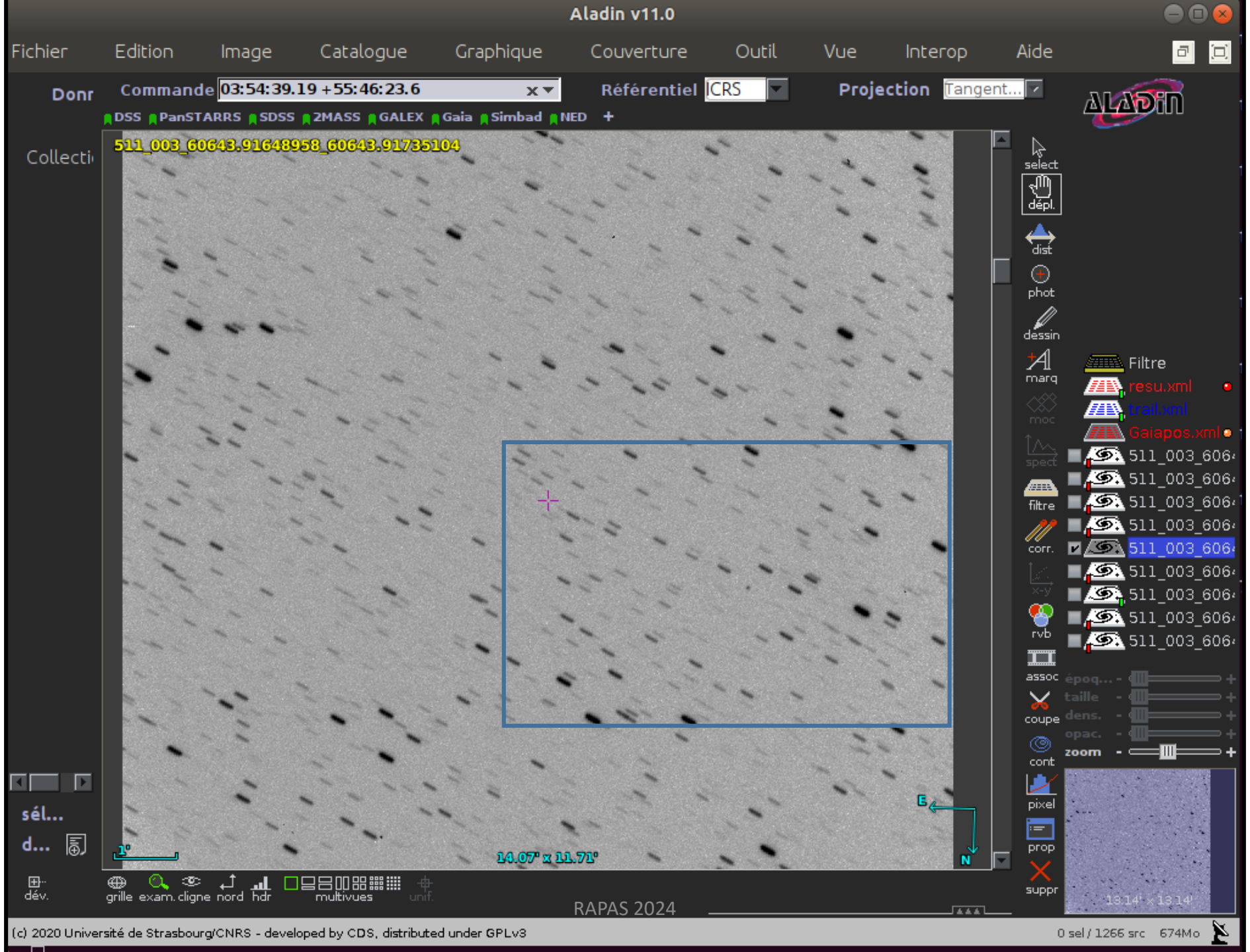
RAPAS 2024


Aladin v11.0
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03:54:39.19 +55:46:23.6
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PanSTARRS
SDSS
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GALEX
Gaia
Simbad
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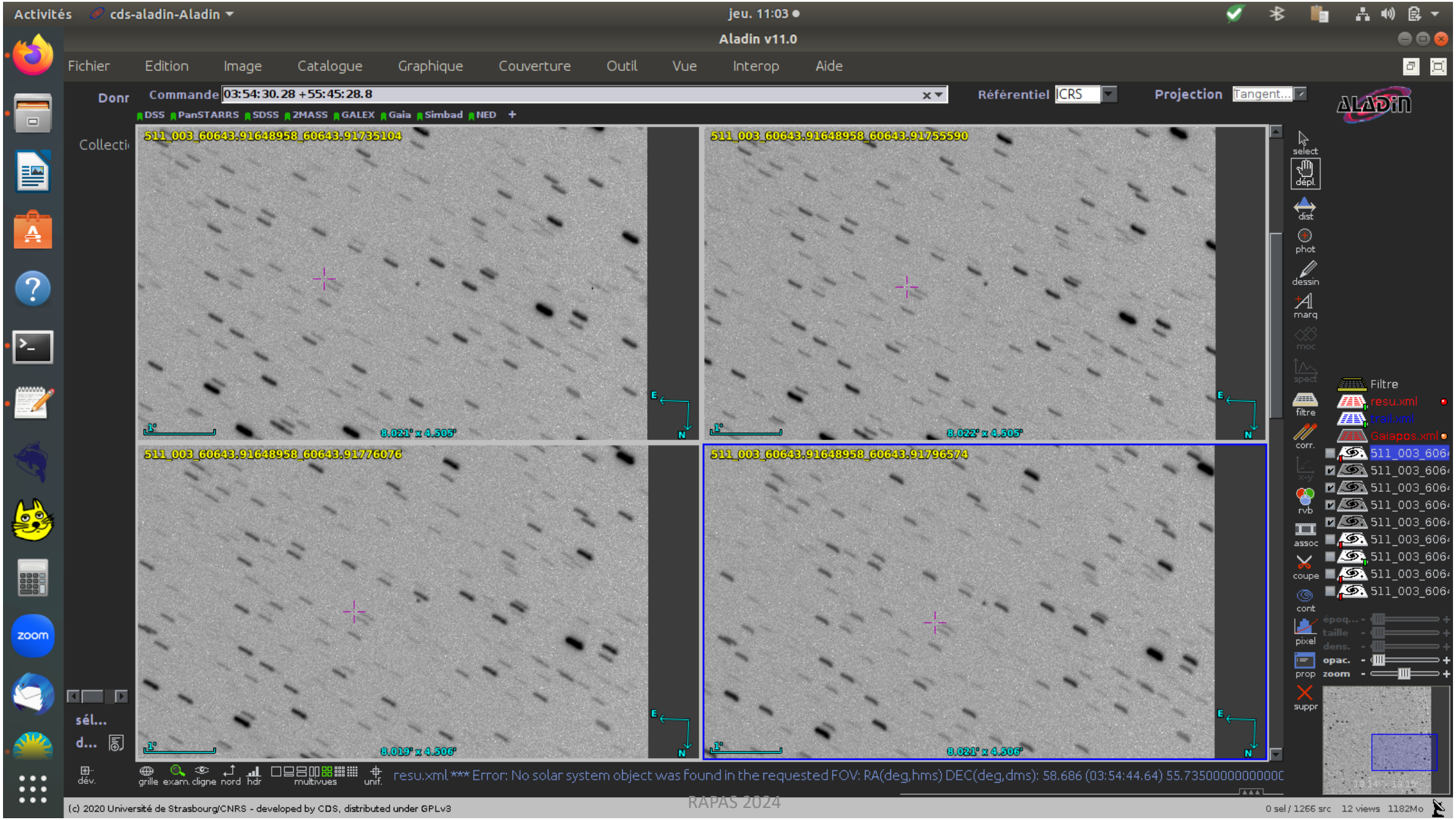
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jeu. 11:03
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Catalogue
Graphique
Couverture
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ICRS
Projection
Tangent...
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PanSTARRS
SDSS
2MASS
GALEX
Gaia
Simbad
NED
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511_003_60643.91648958_60643.91755590
511_003_60643.91648958_60643.91776076
511_003_60643.91648958_60643.91796574
8.021' x 4.505'
8.022' x 4.505'
8.019' x 4.506'
8.021' x 4.506'
Filtre
resu.xml
trail.xml
Gaiapos.xml
resu.xml *** Error: No solar system object was found in the requested FOV: RA(deg,hms) DEC(deg,dms): 58.686 (03:54:44.64) 55.73500000000000
(c) 2020 Université de Strasbourg/CNRS - developed by CDS, distributed under GPLv3
0 sel / 1266 src
12 views
1182Mo

Publication dans une MPC Electronic Circular

Si observation et mesure astrométrique **rapide** d'un NEA et **délivrance au MPC**…

⇒ Possibilité de figurer sur une MPEC (MPC Electronic Circular) confirmant la détection du NEA

- Désignation provisoire de l'astéroïde
- Liste des stations et des observateurs
- Liste des O-Cs

=> **Visibilité dans Astrophysics Data System (ADS)**

M.P.E.C. 2024-X86 Issued 2024 December 4, 07:09 UT

The Minor Planet Electronic Circulars contain information on unusual minor planets, routine data on comets and natural satellites, and occasional editorial announcements. They are published on behalf of Division F of the International Astronomical Union by the Minor Planet Center, Smithsonian Astrophysical Observatory, Cambridge, MA 02138, U.S.A.

Prepared using the Tamkin Foundation Computer Network

MPC@CFA.HARVARD.EDU
URL https://www.minorplanetcenter.net/ ISSN 1523-6714

2024 XR1

Observations:

```
K24X01R* C2024 12 01.38037204 12 18.023-10 21 56.95         20.22wXEX086F52
K24X01R  C2024 12 01.39448404 12 15.479-10 17 40.61         20.23wXEX086F52
K24X01R  C2024 12 01.42267004 12 10.414-10 09 12.59         20.03wXEX086F52
K24X01R  C2024 12 01.54353204 11 50.762-09 33 57.48         19.95GVEX086F52
K24X01R  C2024 12 01.54416304 11 50.675-09 33 46.59         19.84GVEX086F52
K24X01R pC2024 12 01.80667904 11 48.12 -08 25 14.2          19.8 GVEX086L01
K24X01R IC2024 12 01.80903504 11 47.86 -08 24 40.7          19.6 GVEX086L01
K24X01R pC2024 12 01.81322504 11 47.32 -08 23 37.1          19.5 GVEX086L01
K24X01R KC2024 12 01.83933204 11 44.28 -08 17 10.9          19.6 GVEX086L01
K24X01R KC2024 12 01.94205404 11 31.96 -07 52 30.5          19.4 GVEX086587
K24X01R KC2024 12 01.94599504 11 31.44 -07 51 34.8          19.4 GVEX086587
K24X01R KC2024 12 01.94922004 11 31.02 -07 50 48.6          19.2 GVEX086587
K24X01R  C2024 12 01.96014 04 11 30.20 -07 48 11.0          20.2 RXEX086511
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K24X01R  C2024 12 01.96445 04 11 29.63 -07 47 10.3          20.1 RXEX086511
K24X01R  C2024 12 01.96564 04 11 29.50 -07 46 53.3          19.9 RXEX086511
K24X01R  C2024 12 01.96688 04 11 29.33 -07 46 36.5          20.1 RXEX086511
K24X01R KC2024 12 02.13992404 11 23.53 -07 07 28.9          20.2 GVEX086H21
K24X01R KC2024 12 02.14271904 11 23.22 -07 06 52.5          20.5 GVEX086H21
K24X01R KC2024 12 02.14551504 11 22.87 -07 06 16.4          20.9 GVEX086H21
K24X01R 1C2024 12 02.16232304 11 17.949-06 59 08.55         19.7 GVEX086W57
K24X01R |C2024 12 02.16398004 11 17.720-06 58 44.60         20.2 GVEX086807
K24X01R |C2024 12 02.16580004 11 17.500-06 58 21.80         20.1 GVEX086807
K24X01R |C2024 12 02.16766004 11 17.290-06 57 57.70         19.8 GVEX086807
K24X01R |C2024 12 02.16948704 11 17.020-06 57 34.40         20.2 GVEX086807
K24X01R KC2024 12 04.26065104 09 52.300-01 48 16.50         22.81GVEX086I52
K24X01R KC2024 12 04.26286704 09 52.190-01 48 02.20         21.34GVEX086I52
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Observer details:

511 Haute Provence. Observers W. Thuillot, M. Saillenfest. Measurers M. Saillenfest, S. Bouquillon, F. Taris, T. Carlucci, C. Barache. 1.20-m f/6 reflector + CCD.

587 Sormano. Observers P. Sicoli, A. Testa. Measurer P. Sicoli. 0.5-m f/6.8 reflector + CCD.

807 Cerro Tololo Observatory, La Serena. Observers T. Linder, R. Holmes. 1.00-m f/10.5 Ritchey-Chretien + CCD.

F52 Pan-STARRS 2, Haleakala. Observers J. Herman, T. Lowe, P. Minguez, A.

Conclusion

- Besoins d’astrométrie en alerte toujours prégnant
- Objets géocroiseurs: cibles de choix très utiles
- MPC confirmation page: détections faites très récemment à valider
- ESA piority & risk lists: autres cibles utiles
- Possibilité d’avoir visibilité : publication éventuelle dans ADS